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that it is the Δ'' table that has hitherto caused the most trouble in construction and in use, and that it is this very table which is hereby simplified.

(*c*) That with a view to (i) dispensing as often as possible with Δ^{iv} corrections (as such) without seriously impairing the simplicity of treatment of the original second differences, and (ii) at the same time minimising resulting error (whether individual or mean, neglected or corrected), I have selected the particular device (as in the above table of coefficients) of subtracting $\frac{317}{1728}$ of the mean Δ^{iv} from the mean Δ'', on the grounds that the resulting "residual Δ^{iv} corrections" are generally negligible, that their mean algebraical value throughout an interval is *zero*, and their maximum value is about half a thousandth of the original mean Δ^{iv}, so that these residuals may be tabulated in three or four lines only, and then never referred to except as a matter of fact when the Moon is near a maximum declination, and that declination is also a large one by reason of the position of the Moon's node. Other devices might have been chosen, but at the sacrifice of one or more of these practical advantages. Moreover, further pursuit of this same method (such as entrusting the broad fifth-difference effect to the third-differences) would on the whole in each case rather complicate than expedite the work.

7. In the tables, which are purely *additive*, only such information is given as is necessary and sufficient, (*a*) to produce the end figure of the new quantities, and (*b*) to enable the calculator to fill in the rest with ease. By this economy the tables are reduced to very small compass.

Comparisons of the Geocentric Places of Uranus, Neptune, and the Sun, calculated from Newcomb's Tables, with their Places calculated from Le Verrier's Tables, for the Year 1904. By A. M. W. Downing, D.Sc., F.R.S.

This paper is a continuation of one printed in *Monthly Notices*, vol. lix., No. 10. The *Nautical Almanac* for 1904 is the first in which Newcomb's Tables of *Uranus* and *Neptune* are used, and a comparison is made at convenient intervals throughout the year between the places there given for Greenwich noon and the corresponding places computed from those given in the *Connaissance des Temps* for 1904 for Paris noon.

I have also added a comparison of the Sun's places, deduced in the same manner, at intervals of eight days throughout the year.

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URANUS, 1904.—*Corrections to Le Verrier's Tables.*

Day. 1904.	R.A.		Dec.	Day. 1904.	R.A.		Dec.
	Time.	Arc.			Time.	Arc.	
	s	″	″		s	″	″
Jan. 1	−·33	−4·5	+0·1	July 3	−·34	−4·7	0·0
Feb. 2	−·34	−4·7	0·0	Aug. 4	−·33	−4·5	+0·2
Mar. 1	−·36	−4·9	0·0	Sept. 1	−·34	−4·7	+0·1
Apr. 2	−·36	−4·9	0·0	Oct. 3	−·31	−4·2	+0·1
May 4	−·37	−5·1	+0·1	Nov. 4	−·31	−4·2	−0·1
June 1	−·36	−4·9	−0·1	Dec. 2	−·32	−4·4	−0·2

NEPTUNE, 1904.—*Corrections to Le Verrier's Tables.*

Day. 1904.	R.A.		Dec.	Day. 1904.	R.A.		Dec.
	Time.	Arc.			Time.	Arc.	
	s	″	″		s	″	″
Jan. 1	−·38	−5·3	−2·0	July 3	−·38	−5·3	−1·8
Feb. 2	−·41	−5·7	−1·8	Aug. 4	−·38	−5·3	−1·7
Mar. 1	−·41	−5·7	−1·9	Sept. 1	−·40	−5·6	−1·7
Apr. 2	−·39	−5·4	−1·9	Oct. 3	−·41	−5·7	−1·8
May 4	−·39	−5·4	−1·8	Nov. 4	−·41	−5·7	−1·9
June 1	−·38	−5·3	−1·7	Dec. 2	−·41	−5·7	−1·9

SUN, 1904.—*Corrections to Le Verrier's Tables.*

Day. 1904.	R.A.		Dec.	Day. 1904.	R.A.		Dec.
	Time.	Arc.			Time.	Arc.	
	s	″	″		s	″	″
Jan. 1	−·06	−0·8	−0·2	May 24	−·02	−0·3	+0·1
9	−·04	−0·6	−0·3	June 1	−·01	−0·1	+0·3
17	−·04	−0·6	−0·2	9	−·01	−0·1	+0·2
25	−·04	−0·6	−0·3	17	−·02	−0·3	+0·3
Feb. 2	−·03	−0·4	−0·2	25	−·02	−0·3	+0·2
10	−·03	−0·4	−0·3	July 3	−·02	−0·3	+0·2
18	−·03	−0·4	−0·4	11	−·03	−0·4	+0·3
26	−·03	−0·4	−0·3	19	−·02	−0·3	+0·3
Mar. 5	−·03	−0·4	−0·1	27	−·02	−0·3	+0·3
13	−·02	−0·3	−0·1	Aug. 4	−·02	−0·3	+0·2
21	−·03	−0·5	−0·2	12	−·02	−0·3	+0·2
29	−·03	−0·5	−0·1	20	−·03	−0·4	+0·3
Apr. 6	−·01	−0·1	0·0	28	−·02	−0·3	+0·2
14	−·02	−0·3	−0·1	Sept. 5	−·03	−0·4	+0·2
22	−·02	−0·3	0·0	13	−·04	−0·6	+0·3
30	−·01	−0·1	+0·1	21	−·04	−0·6	+0·3
May 8	−·02	−0·3	+0·2	29	−·04	−0·6	+0·1
16	−·01	−0·1	+0·2	Oct. 7	−·05	−0·7	+0·2

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Day. 1904.	R.A. Time.	Arc.	Dec.	Day. 1904.	R.A. Time.	Arc.	Dec.
	s	″	″		s	″	″
Oct. 15	−·05	−0·7	+0·3	Nov. 24	−·06	−0·8	−0·1
23	−·06	−0·9	+0·1	Dec. 2	−·05	−0·7	−0·1
31	−·06	−0·9	0·0	10	−·06	−0·8	−0·1
Nov. 8	−·06	−0·9	0·0	18	−·07	−1·0	−0·2
16	−·07	−1·0	+0·1	26	−·05	−0·7	−0·3

Experimental Reduction of some Photographs of Eros made at the Cambridge Observatory for the Determination of the Solar Parallax.

By Arthur R. Hinks, M.A.

1. The long series of photographs of the planet *Eros* which I obtained last winter with the new Sheepshanks equatorial of the Cambridge Observatory was very much interrupted by bad weather. My programme was to make four exposures on the planet every hour between 6^h E. and W.—the construction of the instrument precludes greater hour-angles—and, of each set of four, two were made following the stars and letting the planet trail, two following the planet and letting the stars trail. There was only one case of two consecutive nights clear, or nearly so, right through, viz. 1900 November 9 and 10, and the plates taken on these nights, when the planet was but little past opposition, and the parallax factor had become fairly large, were clearly indicated as the subject of preliminary and experimental reductions. The plates were to be centered for each night on the position of the planet at Berlin midnight, the epoch of Professor Millosevich's ephemeris; but, by an accident very fortunate for our present purpose, the plates on the 9th were set to a centering very near that proper to the 10th, and the mistake was discovered in time to use the same point for the latter plates, so that all the exposures to be here treated have approximately the same centering on the sky.

2. As many as twenty exposures were made on one plate, the displacement necessary between each being given to the plate-carrier on rectangular slides on the breach-piece of the telescope, not by displacement of the pointing of the telescope on the sky. There is an obvious advantage in this, that the centre of projection remains unchanged, and all the exposures can be made comparable by linear formulæ of reduction, which is not strictly the case when the pointing of the telescope is changed.

3. The stars on the plates whose meridian places are known are not very symmetrically distributed about the locus of the planet, and many of them are inconveniently bright. It was necessary to consider the possibility of a systematic error due to the trail of either stars or planet—the motion of the planet was